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The Effect of Tip Blight on Growth and Survival of Outplanted Loblolly Pine after Two Years

by

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Abstract

Growth and survival after two years of outplanted loblolly pine with tip blight were adversely affected by the disease in one of two outplantings. Significant differences at the 0.5 percent level for diameter and at the 1.0 percent level for survival and seedling height were seen on the mesic site. The wet site showed differences only at the 10 percent level for diameter and height, and is not considered biologically important.

Introduction

In December, 1979, two sites, a mesic one (generally sufficient moisture but without standing water) at the Stuart Seed Orchard near Pollock, Louisiana, and a wet one (commonly has standing water) on the Strong River Ranger District of the Bienville National Forest in Mississippi, were used for outplanting tip-blight infected and non-infected loblolly pine lifted from the W. W. Ashe Federal Nursery at Brooklyn, Mississippi.

The disease, probably caused by a species of Phomopsis, kills back two to three inches of the terminal and, after the seedling resprouts, tends to delay hardening-off by the seedlings. It was decided to outplant infected stock and compare its performance with non-infected checks.

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Results

After two years the data show significant differences in survival, diameter and height for trees planted on the mesic site. Data are presented in Table 1.

Differences for survival and height were significant at the 1% level, while diameter comparisons were significant at the 0.5% level. In this test fewer blighted seedlings survived and those which did were shorter and thinner than the non-infected check trees.

Although differences can be seen in Table 2 for all three parameters measured on the wet site, they were not significantly different at the five percent level after two years.

Discussion

Differences in disease severity as reflected in survival, height growth and diameter growth observed between sites are probably due to moisture availability. During the severe drought of 1980 the Orchard plot was definitely drier, had greater slope, more competition and as a result, less available water. Despite signs of rabbit feeding on the wetter Mississippi plot, these trees are taller and had better survival, even though diameters are smaller than the Orchard plot.

Observations will be terminated after a third year's readings in December, 1982.

Conclusion

Thus far, the inference can be made that tip-blighted seedlings should be culled (or at least separated) in the nursery if it is intended that they be planted on mesic sites. It appears that on this type of site, by far the most common in the Southeast, tip blighted seedlings are at a competitive disadvantage when compared to healthy trees of the same age.

Table 1. Survival (%), height (cm), and diameter (mm) averages for five replicates of tip-blight infected and check loblolly seedlings at the Stuart Seed Orchard - Pollock, Louisiana, two years after outplanting.

	Survival					Over All	Height					Over All	Diameter					Over All
Tip-Blight	40	64	16	36	48	41.0	68.2	62.8	54.5	72.2	55.0	63.0	12.5	10.7	9.0	12.4	8.8	10.8
Check	68	76	76	52	64	67.0	81.2	78.0	72.0	77.4	78.1	77.2	16.6	15.8	14.4	15.7	15.3	15.5

Table 2. Survival (%), height (cm), and diameter (mm) averages for five replicates of tip-blight infected and check loblolly seedlings at the Strong River R.D., Bienville National Forest near Homewood, Mississippi, two years after outplanting.

	Survival					Over All	Height					Over All	Diameter					Over All
Tip-Blight	84	56	80	92	72	76.8	67.2	56.7	87.3	64.1	66.6	69.0	11.7	8.4	13.2	7.9	8.4	9.9
Check	88	84	92	88	80	86.4	80.7	85.2	82.3	87.6	79.3	83.1	12.9	12.9	12.1	12.5	12.4	12.6